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MEMO FROM J. C. ROGERS TO C. GORDON JONES RE ORGDP VF₆ RELEASES
HISTORICAL SEARCHES**(This section to be completed by Document Center)**Date request received 10/24/95

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I N T E R O F F I C E M E M O R A N D U M

Date: 12-Sep-1994 09:38am EDT
From: James G Rogers
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TO: C Gordon Jones

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CC: James G Rogers

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This document has been approved for release
to the public by:

Ray W. Hall *A.S. Quist* 10/25/95
Technical Information Officer Date
Oak Ridge K-25 Site

Subject: ORGDP UF6 Releases - Historical Search
File: READ 010058

On order to document the work we have been doing the past two weeks, I have tried to summarize the major actions we have taken. Please review the information below and revise/add to it so we can provide better documentation for the next person who tries to do this.

On August 30, 1994, Robert Merriman sent M.E. Mitchell a letter entitled "UF6 Release Information" requesting Environmental Compliance personnel to work with the Gaseous Diffusion Plants to establish what information we have regarding UF6 releases. Gordon Jones and Jim Rogers have coordinated the effort working with Larry Payne at PGDP and Dave Taylor at PORTS. The actions described first are the actions taken at the K-25 Site. They are:

* DOE Report OR-890 of May 1988 entitled "Historical Radionuclide Releases from Current DOE Oak Ridge Operations Office Facilities" was reviewed. Two earlier reports were used in preparing OR-890. These reports were K/HS-69 entitled "ORGDP Uranium Discharges" by L.W. Long and J.G. Rogers of May 1985; and K/HS-95 entitled "ORGDP Historical Uranium and Radionuclide Release Report" by A.C. Lay and J.G. Rogers dated February 28, 1986.

The primary sources of information for these reports were uranium accounting records and in later years, uranium emission calculations from stacks and outfalls based on uranium concentrations in the effluents. The effluent information utilized was the report entitled "Radioactive Effluent/Onsite Discharges/Unplanned Releases" prepared annually (in later years) for the U.S. A.E.C. and U.S. D.O.E. All UF6 release numbers in OR-890 could not be verified simply because all backup files could not be located. L.W. Long and J.G. Rogers searched through approximately 30 boxes of stored files in K-303-8 and located some of the original information used in preparing the above reports; however all information evidently was not retained. Uranium accounting personnel were contacted in an attempt to retrieve the original uranium accounting records. Many of the records were located; however there are gaps in the data. For example, a tabulation of UF6 releases from 1957 to 1975 could not be located except for a listing of UF6 releases greater than 1 kilogram which was evidently prepared from uranium accounting records. The listing was transmitted in an Office Memorandum dated May 21, 1982 from A.J. Legeay to W.F. Thomas entitled "Uranium Material Releases." The listing contains 156 accidental releases of greater than 1 kilogram which occurred

between 4/28/45 and 5/27/81. Most of these releases appear to be included in OR-890; however a few discrepancies from year to year exist. Since all backup files could not be located, it is not possible to verify all numbers. Margaret Barham in Uranium Accounting says some of the files we were trying to locate may be in the U.S. Government Records Center in Atlanta, Ga. and difficult to retrieve.

* Also, several MMES employees and retirees were interviewed in an attempt to determine if other accidental releases may have occurred which were not included in the May 21, 1982 memo above. Also, they were asked about intentional releases such as leak detector testing and fire/cylinder testing to design overpacks.

(Gordon - What do you think about describing who we talked with and our general conclusions here?)

* While talking to H.M. Noritake, he mentioned a draft report UEO-216 entitled "Technical Information for Assessing Cost Responsibility for Decontamination and Decommissioning of Gaseous Diffusion Plants" dated February 1992 which he, J.H. Thomas (PGDP), and E.R. Wagner (PORTS) authored. The report lists UF6 gas release information for the K-25 Site, PGDP, and PORTS for cascade buildings, feed plant, and other buildings but excludes high assay portions of the cascades (K-25, K-27, and X-326 buildings). Most of the information for the K-25 Site was prepared using information contained in the May 21, 1982 memo from Legeay to Thomas. However, there are some differences. (Gordon - For the years 1951, 1955, and 1956 we need to talk to Hank Noritake and try to establish were he got additional numbers over and above the Legeay memo.) Also, the report mentions that UEO-216 contains much the same type of information as contained in OR-890; however the report recognizes that some discrepancies exist. The report states that since the information in UEO-216 was derived from detailed lists of releases supplied by each of the GDPs, it was used for analysis in the report. No attempt was made to resolve the discrepancies between UEO-216 and OR-890. It was mentioned that OR-890 included vented release data from process facilities.

For most years, the release quantities reported in OR-890 are higher but within the same order of magnitude as the quantities reported in the Legeay memo and in UEO-216 (Draft). This would seem reasonable since the original uranium accounting records used in preparing OR-890 also included release quantities of less than 1 kilogram, and uranium emissions to air and water reported in the Radiological Effluent Report referenced above.

In conclusion, no major releases in addition to those already reported were uncovered during this investigation. (Gordon- Can we say this? Don't you think we need to talk to Hank first. Also, what other things have we done that I haven't mentioned?)

Received from
Gordon Jones 10/10/94

INTERVIEWS:

In starting the interview process we looked to several sources: 1) Engineering personnel who had been active in the study of Plume Models in the late 1970s and 1980s, 2) Development and R&D personnel, including Gordon Jones, who were involved in some studies on the plume modeling and UF_6 release detector work, 3) Cascade/Operations personnel, active and retired, who may have had knowledge of accidental /intentional releases, including disposal of unsafe containers.

1. Engineering Personnel: Mickey Crowley, Robert A. Just and Sanford G. Bloom worked on developing a plume model for the dispersion and fall out of UF_6 and its hydrolysis products in the late 1970s and 1980s. Discussions of release information with Just and Bloom immediately brought forth the Paducah release information(T. J. Mayo, KY-L-824, April 15, 1976 at Paducah) and the fire - cylinder test program of A. J. Mallett, *ORGDP Container Test and Development Program Fire Test of UF_6 -Filled Cylinders*, K-D-1894, UCND, January 12, 1966 (This is report with the color photograph of the large fire ball published in Knoxville NS on Friday, September 2, 1994 for which we supplied the color photograph. These releases involved a total of approx. 606.9 lbs. {275.5 kg } of UF_6 in 6 tests. The largest being two different tests of approx. 250 lbs. - Fire ball.).

Further questioning about French Government tests in the 1980s in collaboration with our release studies resulted in three reports by Just on analysis of these tests. These three test were conducted at the French Government Test Site in Bordeaux, France in April 1986, April 1987 and June 1989. Just and Bloom analyzed and reported on these tests in reports; K/D-5720, K/D-5806, and K/D-6092. Just recalls the tests were about 150 kg each.

2. Development and R&D Personnel: Dr. E. John Barber and Dr. Robert L. Ritter were interviewed about their knowledge of intentional/experimental UF_6 Releases. Both remembered the above releases of Mallett in 1966 and Mayo in 1976. Barber also had the documents on the releases in the duct work in K-33 cited in the Knoxville NS. They have a Stief to Wing letter of February 23, 1977 on UF_6 Test Release; a W. O. Gentry to M. J. Ellis letter, May 27, 1977 citing these releases; and a Confidential Report, K-GD-1342 T. H. Monk to G. R. Jamison, UF_6 Outleakage Tests in K-33, October 8, 1976.

Barber and Ritter also cited another Confidential Report authored by Dr. R. L. Ritter, K-GD-916, *Containment of Released Uranium Hexafluoride*, November 7, 1973. This report discusses some results of a series of release tests in the K-33 cell housings. There was about 45 tests in the 1971 - 1973 series. Seven tests were specifically cited in the document and totalled about 6 kg of UF_6 released. This test series appears to be new information, probably because of the classified and very limited document distribution.. Barber and Ritter stated that they had the only copy, but we think the document is referenced in the K-25 Records. Barber also cited some notations in his classified research notebooks.

Barber and Ritter also recalled some experimental releases in a HEPA filtered hood in K-1006. These were small releases, i.e., 1 to 10 g/min. which were photographed for use in training operators. This was to be able to estimate small release sizes in the cascade and operating areas. They did not think this was ever documented.

Barber, Ritter and Jones also recalled the release work done at ORGDP, Paducah and Portsmouth in the mid 1970 to mid 1980 time frame. These studies were undertaken in support of the

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Sam W. Hall for A.S. Ruiz 10/25/95
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Martin Marietta Energy Systems, Inc.,
for the U.S. Department of Energy under
contract DE-AC05-84OR21400.

plume modelling work and for assessing various technologies for knocking down the cloud or removing the UF_6 and reaction products from an air stream in the event of an accidental release. In this work all UF_6 releases were carried out in special containment chambers and no material was released to the atmosphere. A brief summary report of this work was published in 1983; Boyd, D. E., Jones, C. G., and Seltzer, S. F., *Assessment of Consolidated UF_6 Release Studies*, KY/L-1213, Union Carbide Corporation, Nuclear Division, Paducah Gaseous Diffusion Plant, September 7, 1983. Unclassified. Other references to this work are cited in this document.

John H. Pashley, Harold T. Conner, and Jack L. Petty were interviewed with regard to releases in other development facilities, i.e., K-1413, K-1405, Cascade Pilot Plant, Test Loops, etc. There was no knowledge of intentional/experimental releases, but recall of accidental releases. From accountability/release records we know that at least some, if not most, of these are accounted for due to building location.

3. Cascade/Operations Personnel: A. J. Legeay, Joe Dykstra, Pete Peterson, Bob Dyer, and Jim Rogers were contacted about recollections of releases. Little if any new information was brought forth. Most remembered the routine type accidental releases and the significant events, i.e., large cylinder releases or major cascade events/releases. Here again these are cited in the inventory/ release reports published over the years and used to obtain data in OR-890 and UEO-216 (DRAFT). With regard to UEO-216 (Draft) discussion with H. M. Noritake did not turn up any additional information on the discrepancies in the release amounts for some years. Hank stated that to the best of his knowledge he had used the accountability data and that from the Legeay Memos. Nevertheless there is some significant differences; some of these we believe can be attributed to the year the data was assigned when the release was say within the last week of the year. Other reasons for the differences may be due to the fact that only UF_6 releases (i.e., no solutions) may have been considered in one case and also only releases greater than 1 kg may have been considered in some cases.